

REMARKS

Claims 1-42 are currently pending in the subject application and are presently under consideration. Claims 1, 5, 10, 13, 17, 22, 24, 27, 28, 35, and 42 have been amended as shown on pp. 2-7 of the Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Rejection of Claims 1-37, and 41 Under 35 U.S.C. §101

Claims 1-37, and 41 stand rejected under 35 U.S.C. §101 because the claimed invention is drawn to non-statutory subject matter since the claims are drawn to an abstract mathematical algorithm or disembodied program steps and are not tangible. This rejection should be withdrawn for at least the following reasons.

Independent claim 1 recites *a system that performs verification and/or validation of an APC assisted process via simulation, comprising a film stack representation and a canonical model that predicts process rates, the process rates predicted based at least in part upon an exposed material in the film stack representation*, and independent claim 30 recites a related method. It is erroneously contended that “applicants have merely claimed an abstract algorithm or disembodied program steps that are not embodied on a computer-readable medium and specifically employed as a computer component to be executed on a processor and perform the claimed limitations. Thus, Applicants have attempted to claim nonfunctional descriptive material.” However, this is a mistaken contention.

According to *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999), the legal standard set forth by the Federal circuit for determining whether claims are directed towards statutory subject matter is whether the claims can be applied in a practical application to produce a useful, concrete and tangible result. In *AT&T*, the patent at issue described a message record for long-distance telephone calls that included a primary interexchange carrier (“PIC”) indicator, which allowed for differential billing treatment for subscribers. (*See AT&T*, 172 F.3d at 1353). *AT&T*’s claimed process applied Boolean algebra “to determine the value of the PIC indicator, and [applied] that value through switching and recording mechanisms to create a signal useful for billing

purposes.” (See *AT&T*, 172 F.3d at 1358). Relying on its holdings in *State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied*, 525 US 1093 (1999) and *Arrhythmia Research Tech. Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992), the Court held that the AT&T process was patentable subject matter:

In *State Street*, we held that the processing system there was patentable subject matter because the system takes data representing discrete dollar amounts through a series of mathematical calculations to determine a final share price – **a useful, concrete, and tangible result**. See 149 F.3d at 1373, 47 USPQ2d at 1601. In this case, Excel argues, correctly, that the PIC indicator value is derived using a simple mathematical principle (p and q). But that is not determinative because AT&T does not claim the Boolean principle as such or attempt to forestall its use in any other application. It is clear from the written description of the ‘184 patent that AT&T is only claiming a process that uses the Boolean principle in order to determine the value of the PIC indicator. The PIC indicator represents *information* about the call recipient’s PIC, **a useful, non-abstract result** that facilitates differential billing of long-distance calls made by an IXC’s subscriber. Because the claimed process applies the Boolean principle to produce a **useful, concrete, tangible result** without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of Section 101. See *Arrhythmia Research Tech. Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1060, 22 USPQ2d 1033, 1039 (Fed. Cir. 1992) (“That the product is numerical is not a criterion of whether the claim is directed to statutory subject matter.”). See *AT&T*, 172 F.3d at 1358 (emphasis added).

The subject independent claims 1 and 30 provide that the claimed system and method are utilized to predict process rates so as to verify and validate an Advanced Process Control assisted semiconductor manufacturing process – a useful, concrete and tangible result – therefore satisfying the legal requirement set forth by the Federal Circuit in *AT&T Corp. v. Excel Communications, Inc.*

Independent claim 41 recites *a data packet that passes between at least two computer processes, comprising a canonical model that predicts process rates based at least in part upon parameters of a tool chamber, an exposed material, and a particular*

process step, and a film stack representation that comprises a layer, the layer including a material utilized by the canonical model to predict a process rate. The contention that claim 41 is drawn to “an abstract algorithm or disembodied program steps” is also mistaken.

In *Arrhythmia*, electrocardiograph signals were input into a computer and filtered and analyzed to determine the average magnitude of the signals. The resulting output signal was then compared to a predetermined level to determine whether the patient was at high risk for a particular arrhythmia. The Court found the claims patentable subject matter stating:

The resultant output is not an abstract number, but is a *signal* related to the patient’s heart activity. These claimed steps of “converting”, “applying”, “determining”, and “comparing” are physical process steps that transform one *physical, electrical signal* into another. *The view that “there is nothing necessarily physical about ‘signals’ “is incorrect. In re Taner*, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982) (holding statutory claims to a method of seismic exploration including the mathematically described steps of “summing” and “simulating from”). . . . The computer-performed operations transform a particular input *signal* to a different output *signal*, in accordance with the internal structure of the computer as configured by electronic instructions. “The claimed invention . . . converts one *physical thing* into another *physical thing* just as any other electrical circuitry would do”. *Arrhythmia*, 958 F.2d at 1059, 1060 (citations omitted) (emphasis added).

In *State Street*, the Federal Circuit remarked upon its decision in *Arrhythmia* and noted that the transformation of electrocardiographic signals was patentable as “a practical application of an abstract idea . . . because it corresponded to a useful, concrete or tangible thing – the condition of a patient’s heart.” (*State Street*, 149 F.3d at 1373). The Federal Circuit also remarked in *State Street* that:

We note that, for the purposes of a Section 101 analysis, it is of little relevance whether [a claim] is directed to a “machine” or a “process,” as long as it falls within at least

one of the four enumerated categories of patentable subject matter *State Street*, 149, F.3d at 1373.

As noted *supra*, the Federal Circuit case law supports that carrier waves/signals fall within at least one of the four enumerated categories of patentable subject matter. The Federal Circuit has made clear that signals are physical things, (*See Arrhythmia*, 958 F.2d at 1059, 1060), and as such carrier signals/waves are not naturally occurring phenomena, but rather, manufactured signals which accordingly are patentable products of manufacture in and of themselves. Thus, ***data packets***, embodied in communication media such as carrier waves/signals, are physical things and are useful and fall within the ambit of being classified as computer readable media. Consequently, the subject claim clearly meets the aforementioned legal standards set forth in *AT&T Corp. v. Excel Communications, Inc.*, *State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, and *Arrhythmia Research Tech. Inc. v. Corazonix Corp.*

Additionally, the Court of Appeals for the Federal Circuit stated in *Eolas Techs., Inc. v. Microsoft Corp.*, 399 F.3d 1325 (Fed. Cir. 2005):

Title 35, section 101, explains that an invention includes "any new and useful process, machine, manufacture or composition of matter." ... Without question, ***software code alone qualifies as an invention eligible for patenting under these categories***, at least as processes. *Id.* at 1338 (emphasis added).

The subject claim clearly pertains to software code comprising transformation instructions encapsulated in a data packet transmitted from one computer process to another computer process. The fact that (i) the data packet that encases the software code during its transmission between two processes, or (ii) the data packet is transmitted as a communication signal between two processes is irrelevant to the fact that it is software code that is contained therein and is being transmitted through utilization of a communication signal. It is submitted that all that is relevant is the fact that software code is being transmitted within the data packet, and that the software code so transmitted produces a useful, concrete and tangible result.

In view of at least the foregoing, it is apparent that applicants' claimed invention produces a useful, concrete and tangible result pursuant to *AT&T Corp. v. Excel*

Communications, Inc. Accordingly, this rejection should be withdrawn with respect to independent claims 1, 30 and 41, and claims that depend there from.

II. Rejection of Claims 1-42 Under 35 U.S.C. §112, first paragraph

Claims 1-42 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement, that the claim(s) contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. This rejection should be withdrawn for at least the following reasons. The claims are in fact described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

The Office Action alleges that "the claims refer to a model and a simulation," further stating that "few specifics of any model and simulation and its implementation are actually disclosed in the specification. The specification appears to be directed at explaining how the program is to be used. The program has not been disclosed." However, the specification is replete with disclosure of simulations, canonical models, and predictive models, including numerous specifics as to the relationships to inputs, outputs, settings, various interactions and process parameters, and otherwise a sufficient description to enable one skilled in the art to practice the invention. For example, a system is described at page 8, line 20 *et seq.* of the subject specification for verifying and validating an Advanced Process Control (APC) assisted model *via* simulating a manufacturing process without utilizing actual and/or test wafers. A description is subsequently provided of a canonical model that can include a predictive model having various input parameters, constraints and outputs corresponding to a simulated process. Examples are disclosed of the types of parameters used in the modeling. (*See, e.g.* page 9, line 16 *et seq.*) In general, this ground of rejection is not understood since the PTO has not demonstrated why the specification is held to be lacking in enablement, nor is it clear why the previous Reply was held to be non-responsive on this basis. For at least the above reasons, it is respectfully requested that this ground of rejection either be clarified or withdrawn.

III. Rejection of Claims 10-15, 17-19, 24, and 35-37 Under 35 U.S.C. §112, second paragraph

Claims 10-15, 17-19, 24, and 35-37 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection should be withdrawn for at least the following reasons. The claims have been amended to overcome the rejection. Withdrawal of this rejection is therefore respectfully requested.

IV. Rejection of Claims 1-42 Under 35 U.S.C. §103(a)

Claims 1-42 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Friedberg in view of the Panoramic v3.01 paper by Pistor (hereinafter Pistor) and five web pages from Panoramic Technology dated 9/28/2002 (hereinafter Panoramic.) This rejection should be withdrawn for at least the following reasons. Friedberg, Pistor and Panoramic, taken alone or in combination, do not disclose or suggest each and every limitation set forth in the subject claims.

To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) *must teach or suggest all the claim limitations*. See MPEP §706.02(j). The *teaching or suggestion to make the claimed combination* and the reasonable expectation of success *must be found in the prior art and not based on the Applicant's disclosure*. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added).

Applicant's claimed invention generally relates to a system and method *that performs at least one of verification and validation of an APC assisted process via simulation*. Independent claim 1 (and similarly independent claims 30, 38, 41 and 42) recites a *film stack representation and a canonical model that predicts process rates, the*

process rates predicted based at least in part upon an exposed material in the film stack representation. The Office Action states that Friedberg "discloses the limitations as subsequently disclosed," citing section 4.4 and pages 72-74. Contrary to these assertions, the cited section 4.4 merely gives a discussion of "PROLITH" and its common use in the industry since 1985. The cited pages 72-74 simply disclose program code for a PROLITH Simulation Engine. There is no disclosure or suggestion of the aforementioned claimed aspects, in these cited passages or elsewhere in this document. The Office Action goes on to state that "Friedberg does not provide many details and does not appear to provide a visual display of the film stack in the user interface." (Applicant agrees that Friedberg fails to provide many details, as noted above.) The Office Action goes on to cite the two documents to Pistor and Panoramic as allegedly supplying this stated deficiency. The Office Action cites Pistor and Panoramic as though these were a single document, even though Pistor is a journal article and Panoramic is a web page. It is noted that this is a highly irregular manner of citing references in an Office Action. Notwithstanding, none of the subject independent claims recite "a visual display of the film stack in the user interface," and therefore, there is no basis for the proposed combination of Friedberg with Pistor and Panoramic. Further, it is noted that the cited passages of Pistor, Figs. 2-5, and the Panoramic web pages, simply disclose indistinct screenshots from a graphical user interface. One skilled in the art would not be led from these thin disclosures into a combination with Friedberg. Additionally, there is nothing in these passages or the remainder of these documents that would cure the above-noted deficiencies of Friedberg, so even if a combination of these references could somehow be deemed proper, it would still fail to disclose or suggest every aspect of the claimed invention. In any case, any combination that might result from these references would only be arrived at after considerable development, over and above the disclosures of these references. Such would not occur to one skilled in the art unless guided by the subject disclosure as a 20/20 hindsight roadmap to the claimed invention.

In view of at least the aforementioned reasons, it is readily apparent that a *prima facie* case of obviousness has not been established against the subject claims. Accordingly, the rejection of independent claims 1, 30, 38, 41 and 42 (and claims which depend there from) should be withdrawn.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [ASHOP103US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

AMIN, TUROCY & CALVIN, LLP

/Himanshu S. Amin/

Himanshu S. Amin

Reg. No. 40,894

AMIN, TUROCY & CALVIN, LLP
24TH Floor, National City Center
1900 E. 9TH Street
Cleveland, Ohio 44114
Telephone (216) 696-8730
Facsimile (216) 696-8731